

MONTHLY JOURNAL OF
THE MUSHROOM GROWERS'
ASSOCIATION

MGA

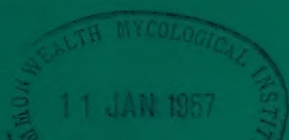
BULLETIN

JANUARY, 1957

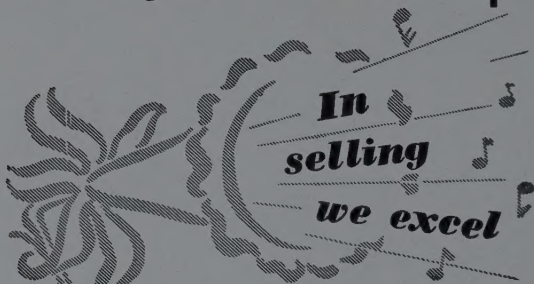
NUMBER 85

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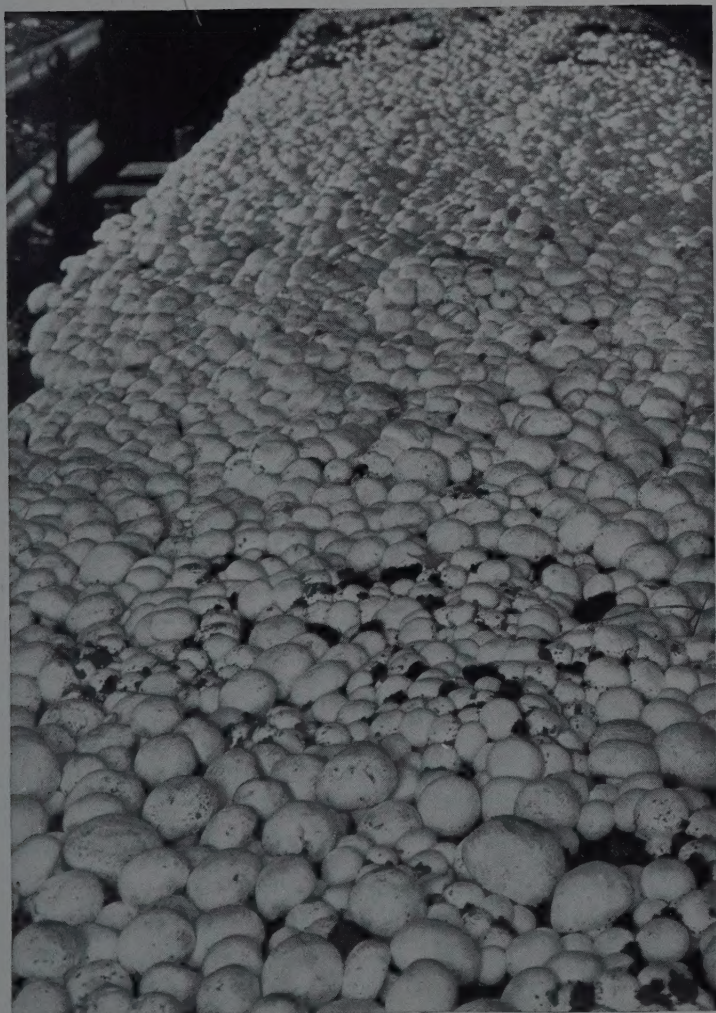
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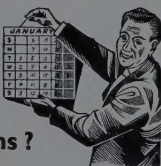
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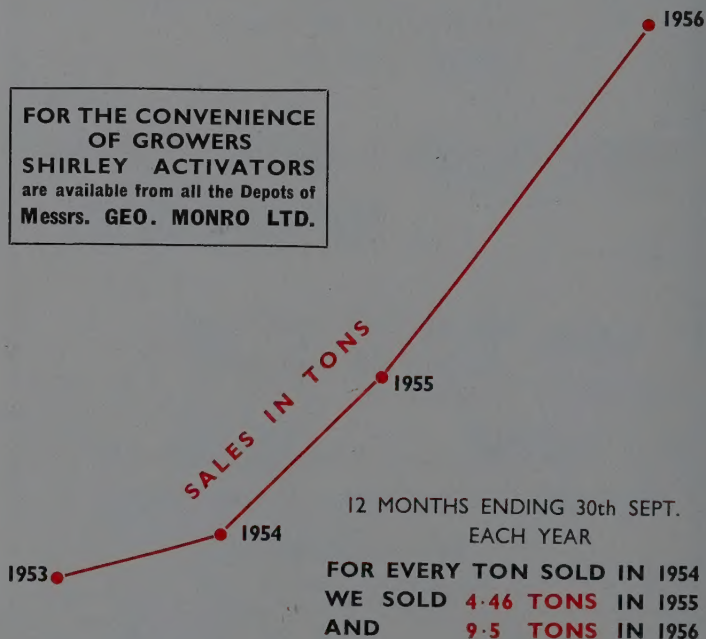
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EDITORIAL

LOOK OUT!

The warning given at a recent meeting of horticulturists in the Vale of Evesham, by Mr. A. G. Sellars, the NFU's expert on horticultural tariff issues, is one which should certainly not go unheeded by the mushroom growers in the United Kingdom.

Mr. Sellars, speaking about the proposed European Free Trade Union, which, it appears, Britain is likely to enter, described the general proposals as a "terrific threat" to British Horticulture, in spite of the assurances given by the Government that agriculture and horticulture will be excluded from these free trade proposals.

It is perhaps a somewhat sobering thought that, in these days, the assurances given by politicians are not considered sufficient in themselves, and that a resistance movement to the general implications of the suggested free trade area, as it applies to horticulture, is already considered a matter of expediency and prudence.

Quite obviously, the interpretation of Mr. Sellars' forthright remarks on the subject is that the time to begin raising a protective barrier is here and now. There may, or may not, be little doubt as to the wisdom of this country entering into such an agreement, an agreement which clearly has advantages and disadvantages; but there can be no doubt whatever about the threat to the mushroom industry such participation could bring without the protection of tariffs—adequate tariffs at that. Neither is there much doubt that, in the event of free trade coming about, tremendous pressure will be brought to bear by those countries anxious and able to export horticultural produce to this country. From countries like Holland, Belgium, France, etc., the export of mushrooms offers no difficulty, and, already carrying the burden of free imports from Eire, the two-way threat, with all its implications, becomes crystal clear to all mushroom producers.

The MGA, along with other horticultural organisations, should give full support to the NFU in the Union's resistance to the threat, even though Britain's participation in the Free Trade Plan may be a strategic necessity.

WRA.

PHORACIDE

FOR CONTROLLING THE PHORID GNAT

B. B. STOLLER

(Stoller Research Company, Santa Cruz, U.S.A.)

Control of the Phorid gnat was discovered by systematically investigating the effectiveness of all available insecticides. The method employed was to catch the gnats in a fly trap, and weigh the insects before and after spraying with an insecticide. By test, it was found that three gnats weigh one milligram, so that 3,000,000 (three million) gnats weigh one kilogram, or about 1,364,000 per pound. Now if the gnats as observed by weighing were very numerous before spraying, but relatively few after spraying with an insecticide, then the insecticide would be considered a satisfactory control.

Fly Trap

The equipment for catching the gnats is a fly trap as shown in the photograph. White light is converged to the opening of a strong suction fan. The suction is sufficient so that gnats attracted to the light are caught in the rotor-fan and sucked into the nylon net. The way the nylon net is blown out erect despite the porosity of the netting, shows how strong the suction is of this electric rotor-fan. The netting is of course so minute that gnats cannot escape.

There is nothing novel about this trap except the design (design patent pending). Mr. E. H. Palfrey described a fly trap in the May issue of the MGA Bulletin. The late Mr. A. C. Davis of the U.S. Dept. of Agriculture described fly traps for catching mushroom flies around 1938. The improvements of the trap in this photograph are the converging light source, the positive suction by a rotor-fan, and the nylon net. In the nylon net the holes can be made very small, so as to retain the gnats and still allow for the expulsion of the exhaust from the strong suction. Unlike muslin or cheese cloth, the surface of the nylon net is smooth so that the gnats do not become entangled in the netting; accordingly, the gnats can be recovered quantitatively for accurate measurement.

It is suggested that fly traps be used as means for sampling the insect population and also as a method for evaluating the effectiveness of insecticides. But fly traps are not recommended for controlling or eliminating flies, for these reasons: It has been found by actual tests that the more fly traps used in a mushroom house, the more flies are caught; this should mean that any one fly trap catches only a sampling of the insect population. Beside, in certain areas of mushroom houses, such as near entrances, the flies are caught more numerous than in remote parts. It is also known that some insects lay their eggs before being attracted to the light, so traps are not an efficient method of control.

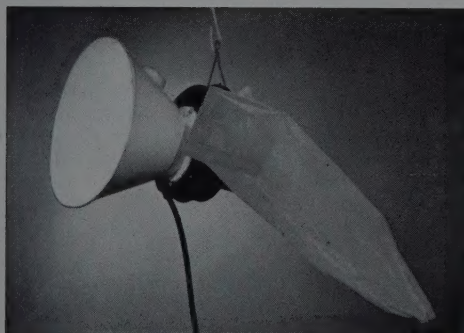
The gnats are so small and difficult to see that they are usually found by the use of fly traps to be much more numerous than they seem. So fly traps are useful for sampling and estimating the insect

population, and also for evaluating the effectiveness of insecticides.

As for colours of lights for the traps, white light is more satisfactory than other colours for luring the fly to the trap. With red light fewer flies were caught than with white light (see Table). "Black light" or ultra-violet light is satisfactory but very expensive and not superior to white light.

Procedure for Weighing and Spraying

For the weighing procedure the net with its catch of flies is removed after 24 hours, and replaced with a fresh net. Sometimes more than 24 hours elapse before the net is changed; in such instances the flies are calculated for 24 hour periods. Many gnats are still lively when the net is removed; if the insects move or fly away, the weighing could not be done accurately. Accordingly, the gnats, including the net, are placed in a bottle with cover, and conveniently put to sleep by pouring in a few drops of chloroform or carbon tetrachloride. (The latter is preferable because it is not combustible.) After a few moments, the gnats may be weighed.



Fly Trap (designed by Stoller Research Co.)

fly into the houses, rather than bred in the beds. When the doors are closed and vents screened, the gnats were observed to creep in between cracks and through the usual fly screen. When using Phoracide, to be described later, flies are found numerously dead on the floor outside of doors and vents; so this is evidence that gnats come in from outside. Further proof is that on cold days and nights relatively few gnats are caught in traps; that is, when it is too cold for the insects to leave the manure piles outside, few of them are caught inside the houses. So spraying insecticides around doors, ventilators and walls should afford control of Phorids. No spraying is practised on the beds.

Insecticides Tested

By the procedures described, many insecticides were evaluated for their usefulness in controlling the Phorid gnat. (The gnat was identified by Dr. W. W. Wirth of the U.S. Dept. of Agriculture as of the family Phoridae, and genus *Megaselia*.) While there was some reduction

The spraying procedure practised was to spray around the doors and ventilators, both inside and outside the mushroom house. The inside walls were also sprayed, although not as heavily. The beds were not sprayed on account of the health hazard, and also because it appears the Phorids are mostly generated outside and

in the fly count 24 hours or so after spraying with the insecticides in the list that follows, none afforded satisfactory control.

1. DDT.
2. Methoxychlor
3. Lindane
4. Chlordane
5. Malathion
6. Aldrin
7. Toxaphene
8. Chlorothion
9. Diazinon
10. Gamtox (10% Lindane)
11. Nicotine sulphate
12. Parathion
13. Pyrenone (7.5% pyrethrins and 75% piperonyl butoxide)
14. Dichloroethyl ether

Fly Baits

To find a weak spot in this gnat's armour, various baits were tried. If an odiferous bait could be found which attracted this buzzard, the bait could be poisoned, and so eliminate this creature with such amazing resistance. Various odiferous substances were tried as hydrolyzed yeast (reported to attract fruit flies), fermenting grape pomace (over which orange-coloured gnats were observed hovering by the thousands), ammoniating manure, fresh manure, liquor from fresh manure—still nothing appealed to these Phorid gnats. Then odiferous chemicals such as dimethylamine (mild ammonia odour) and methylenegenol (known to be attractive to many insects)—still nothing would attract the Phorids.

The New Insecticide—Phoracide

Finally Phoracide was sprayed by the same procedure as mentioned for the other insecticides; at last, good control was achieved. Phoracide is the trade name of a proprietary insecticide composition, consisting of a number of ingredients. It was discovered by investigators of the U.S. Dept. of Health. The formulator and distributor to the mushroom industry is Stoller Research Company.

It is a highly volatile insecticide. It will quickly kill Phorids, just as the carbon tetrachloride did in the testing procedure described previously. But who can bottle-up a mushroom house as if it were a glass container? Besides, the mushrooms might be destroyed in addition to the gnats. Fortunately, investigators of the U.S. Dept. of Agriculture found a device to overcome this volatility. It was discovered that if it were mixed with the chlorinated polyphenyls, the high volatility would be reduced, and the mixture of two of these chemicals would result in an insecticide with a long residual effect. By the use of chlorinated polyphenyls it is possible not only to reduce the volatility, but also to build into the insecticide an increase in stickiness or tackiness. By such tackiness better contact is obtained of the insect with the poisonous principle. Thus, Phoracide has been developed to contain this new insecticide, chlorinated polyphenyls, solvents, and emulsifiers to make it a powerful insecticide spray.

Fig. 1. Record of fly count and control in experimental house.

Date 1956	Insecticide Used	Fly Count			Remarks
		No. Flies	Hrs.	No. Flies in 24 hrs.	
6 Jan.					Fly trap installed
9 "		3600	96	900	
9 "	Dusted with 4% Malathion				Temporary reduction
10 "		375	24	375	with Malathion dust
12 "		2175	48	1087	
12 "	Sprayed with Gamtox ..				Temporary reduction
13 "		495	24	495	with Gamtox
14 "		1575	24	1575	
14 "	Sprayed with Diazinon plus sugar				Sugar recommended to give better adhesion
17 "		2175	72	725	Temporary reduction with Diazinon
18 "	Beds cased.. ..	255	24	255	
23 "		3015	120	600	
24 "		750	24	750	
25 "		330	24	330	Trap with red light
26 "		1350	24	1350	Trap with red light 330
					Trap with white light 1020
27 "		1380	24	1380	Trap with red light 300
					Trap with white light 1080
28 "		1950	24	1950	Trap with red light 300
					Trap with white light 1650
28 "	Sprayed with Phoracide				
29 "		None	24	None	No flies in either trap
30 "		None	24	None	No flies in either trap
1 Feb.		54	48	27	From here on, only traps with white light used
4 "		120	72	40	
6 "		315	48	155	
8 "		900	48	450	
9 "		450	24	450	10 days after spraying
11 "		975	48	485	with Phoracide, flies are numerous again.
11 "	Sprayed with Malathion plus chlorinated polyphenyls ..	990	48	490	Malathion plus chlorinat- ed polyphenyls, ineffec- tive (Dusted to control Dactylium)
13 "	(Dusted with Terraclor) ..				
14 "		105	24	105	Temporary control with Terraclor
15 "		1115	24	1115	Large increase next day
16 "		375	24	375	
16 "	Sprayed with Phoracide				
17 "		None	24	None	No flies
18 "		None	24	None	No flies
21 "		135	72	45	Very few flies 5 days after spraying Phoracide
22 "		120	24	120	
23 "		75	24	75	
24 "		225	24	225	
25 "		45	24	45	
27 "		75	48	37	
1 Mar.		375	72	125	
3 "		180	48	90	
5 "		375	48	185	
6 "		90	24	90	Flies controlled 13 days after 2nd spraying with Phoracide
7 "		75	24	75	
8 "	House emptied				

Control with Phoracide

While a large amount of data was collected during the six months this investigation on insecticides was conducted, only one table of data is presented. These data were gathered from experiments conducted in a small experimental mushroom house. It is the first of a series of experiments in which Phoracide was tested.

As may be observed from data in Table, insecticides such as Malathion, Gamtox (similar to Gammexane), Diazinon, and also the fungicide, Terraclor, resulted in a temporary reduction in the gnat population. But the gnats are numerous again one or two days after spraying or dusting with these insecticides. In contrast, compare results when Phoracide is sprayed: no gnats at all a few days after spraying, and a slow build-up again 10 to 13 days after spraying! The distinction of a good insecticide spray should be that the insects are wiped out completely at least a few days after application of the spray.

The per cent. active ingredients in Malathion dust was 4%; however, only 1% to 2% active substance was present in the other insecticides, including Phoracide, which contained 1.0% active ingredient. The cost of this new active ingredient is about in the same price range as Lindane, and is still produced in small, pilot plant quantities; when it is manufactured on a commercial scale, the price will be reduced.

Insect Entrance and Damage

In the most extensive account of Phorids the writer could find, Dr. C. A. Thomas (Mushroom Insects, Penn. Agr. Exp. Station Bulletin 419, 1942), states that the Phorids come in mainly through the ventilators, doors and cracks in the building immediately after peak-heating. This has also been the experience in California; the gnats creep in through cracks around doors and through the fly screens over ventilators. For this reason the spraying procedure, as previously mentioned, is confined to spraying around doors, ventilators, and lightly on walls.

Dr. Thomas finds that the Phorid larvae (maggots) interfere with the mycelium mostly when the spawn first starts to grow in the beds; only occasionally do the Phorid larvae feed on the mycelium after it has grown through the beds. This has also been the experience in California. When the Phorids were very numerous in the fall of 1955, and as many as 50,000 gnats were caught in a single fly trap overnight, still no larvae could be found in the mycelium permeated compost (however, the casing soil was not thoroughly examined as it might have been). Furthermore, even though thousands of these Phorids were inoculated in bottles of spawn, no eggs, larvae or pupae were found, nor was damage to the spawn in these bottles evident. So it seems the Phorids are not injurious to a bed fully grown with mycelium, although they may delay the initial growth of the spawn. Phorids are also undesirable because they bring into a house contaminating moulds and mites.

Dr. Thomas observes that Phorid larvae "honeycomb" the mushrooms, yet the mushrooms show little external evidence of injury. The Phorids apparently fly in mostly from outside, deposit their eggs

on the casing soil; when the eggs hatch, the larvae eat the freshly grown mycelium in the casing or bore their way into mushrooms. It is known that when the Phorids are very numerous, the yield of mushrooms is definitely reduced.

Future Immunity to Phoracide?

The question may arise whether the Phorids will develop immunity to Phoracide as apparently they have done to other synthetic insecticides. Well, the active ingredient of Phoracide has been tested for two years so far on a variety of insects; as yet no occurrence of immunity to it has been reported. But it is logical to suppose that immunity may develop in time, as has been the experience with so many of the synthetic insecticides. However, it is quite possible that since Phoracide is toxic to the Phorid gnat, which is already resistant to anticholinesterases (the substances against which the insects build up immunity), the gnats have already reached their maximum degree of immunity. So it would seem that the gnats have no device to counteract the toxic principle of the new ingredient, and no change in tolerance may occur in the future.

Conclusion

Phoracide gives satisfactory control of the Phorid gnat. To control this gnat it is required to spray around the doors, ventilators and walls of mushroom houses. The beds should not be sprayed. In the winter time, spraying every two weeks should be sufficient; during the summer months, spraying weekly may be necessary. The active ingredient of Phoracide is a phosphate poison. While it is only about one-tenth as toxic as Parathion, it is more toxic than Malathion; adequate precautions should be taken in handling Phoracide.

NEW PUBLICITY CONTRIBUTION DRIVE

Few will disagree with the widely held view that the efforts made during the past year to publicise the cultivated mushroom have been most successful.

At the last meeting of the MGA Publicity Committee it was unanimously decided to intensify the publicity drive, both as regards publicity contributions and the amount of actual publicity obtained.

With a view to increasing contributions from salesmen in particular, the Secretary was instructed to send out the annual appeal for contributions, and, in addition, to personally visit as many mushroom selling salesmen as possible, in an effort to gather in more money.

It was unanimously decided to invite Mr. A. J. Rudkin, who, in addition to being a mushroom grower is also head of a publicity organisation, to serve on the Publicity Committee.

Mr. Guy Reed stated that up to 300 Art Editors of London Advertising Agencies had been written to, offering to supply them with first-class fresh mushrooms for photographic and display purposes. Mr. Reed is to investigate the publicity advantages of paper bag advertising with recipes, recipe "flimsies," mushroom publicity via an authentic publication to deal solely with mushrooms, small mushroom booklets, advertising by poster transfers, etc., and various other advertising mediums.

THE STRAW POSITION

Price of Manure going up

One of the leading stable manure merchants said during the Eastbourne Exhibition and Conference that there was no need for mushroom growers to become unduly anxious about the position of stable manure supplies in view of the shortage and poor quality of straw, following this year's wet harvest.

He said, "Of course the straw is of much poorer quality than usual and stables are using the supplies available, but the straw will break up more easily and a greater quantity of straw will be needed to provide the customary spring-mattress effect. This quality must effect the quality of the manure but there should be no shortage and prices should not rise excessively. The poor quality is quite inescapable and growers must face up to the fact that, in general, supplies will not be up to the usual standard so far as physical properties are concerned. This will call for greater care in composting and compost will have to be made on the individual merits of each consignment of manure delivered. Hard and fast rules over composting will have to be relaxed a bit and composting experience thus becomes even more important than usual."

At the moment straw merchants are making capital of the position and stables are being charged more for straw. In addition more straw will have to be used and so the stables will expect to be paid more for the manure, he said.

This is the chief reason why some increase in manure prices must be expected and it is anticipated that the price of manure at the stables will rise by 30% to 50%, but as this is roughly 40% of the delivered price the increase to the grower should not be more than 20%. Added to this, the fuel shortage may divert manure from road to rail transport, the effect of which any grower must decide for himself.

There is one bright spot in an otherwise gloomy picture. In some parts of the country more wheat has gone into stack than at any time since before the war. Threshing of this should start in January and the position may ease for about three months, but again where stacks were put up wet the quality will have suffered. If a real shortage comes it will be from May to August when stables will turn the horses out to grass rather than buy expensive bedding—and to save the extra drain on their costs which the increased expenditure on straw has made during the winter. At this time of the year demand is normally low from the general grower and in our opinion it will be up to manure merchants to see that his bread and butter—the mushroom grower—gets first call, he said.

He added:—We think there will be difficulties and some increased prices, but there should not be any price fiasco.

WORLD'S PRESS DIGEST

The mechanical production of horticultural compost has been furthered by Edinburgh Corporation's installation of a Dano plant for utilizing refuse and sewage Briefly the process involves rapid fermentation of waste matter in a stabiliser unit, a long slowly-rotating drum into which air is introduced throughout its length. Aerobic conditions are created and temperatures controlled in such a manner as to give temperatures as high as 150° F. combining with the grinding and mixing action to produce ready-for-use compost in 5 to 6 days.

Commercial Grower, Nov. 16/56.

A major development in the treatment of Irish peat moss during production will shortly result in a new peat product which is said to be four to five times more effective than farmyard manure The product, known as Humona is a free-flowing material capable of spreading mechanically without difficulty. In the treatment of the peat the organic structure is decomposed, but not destroyed, the fibres and plant becoming "aertex" in structure.

Commercial Grower, Nov. 16/56.

Mushrooms have largely replaced lettuce as a glasshouse Winter crop (in Derbyshire).

Commercial Grower, Nov. 23/56.

Again and again, we have noted that unsuitable compost appears to support heavier infestations of many pests, particularly eelworms, than the ideally prepared composts.

M. D. Austin in *Commercial Grower*, Nov. 23/56.

Arnold, director of mushroom research in East Germany, had intended to visit Heltay, his counterpart in Budapest, towards the end of October and stay there a fortnight to plan in detail a conference next year for growers in the "democratic republics." (Actually he left two days before "the closing of the gate.")

F. C. Atkins in *Nurseryman & Seedsman*, Nov. 22/56.

Said Mr. Guy Reed of Woking: "The moon certainly affects mushrooms as it affects human beings, but I would not like to say how."

London Star, Nov. 9/56.

Interest in growing mushrooms is rising steadily in the Netherlands. At present there are 200 mushroom farms, and this year's production is expected to be 50 per cent. up on last year's 1,000 tons. An estimated 700 tons will be exported, compared with 450 tons last year.

Grower, Nov. 24/56.

A new method of controlling blossom-end rot of tomatoes, developed at the Gulf Coast Experiment Station, has proved completely successful It is based on the concept that the primary cause of the condition is calcium deficiency.

Proceedings Florida Horticultural Society 68 (1955), published 1956.

When the Produce Pre-packaging Development Association held its annual meeting, Mr. Jan Gerke, of Marks & Spencers Ltd., said that if branded goods were a guarantee of quality, it was a useful guide to the consumer; but the inclusion of a poor pack would create a prejudice which it was difficult to overcome.

Fruit Trades' Journal, Dec. 1/56.

In a debate on European trade policy in the Commons on Monday, both the Chancellor of the Exchequer and the President of the Board of Trade said that food protection must stay. Mr. Thorneycroft's words were: "We cannot have free trade in agriculture and horticulture because it would make nonsense of our agricultural policies."

Grower, Dec. 1/56.

The predacious fungi, with their wonderful eelworm-trapping mechanisms, promise to be of real help in our fight against the eelworm. Experiments are now in progress to see how they can best be enlisted on our side.

Grower, Dec. 1/56.

About 60 per cent. of all tomatoes and 50 per cent. of mushrooms are known to be prepacked in the U.S.A.

Produce Packaging, Dec./56.

Trial sales (of prepacked mushrooms) were carried out in 6 oz. packs, but Linfields Products Ltd. decided, reluctantly, to use 4 oz. packs. One of the factors influencing this decision was that the consumer did not recognise the extra weight offered for the extra price charged and, in the case of self-service stores, there was no salesman to tell them.

Produce Packaging, Dec./56.

The signs of declining trade in fruit and vegetables, which have been apparent for some months past in the retail trading statistics compiled by the Board of Trade, are confirmed in the latest statement The competition of heavily advertised branded goods has made itself felt, and competition is now recognised to come from the chocolate bar and the pudding mix as much as from the canned vegetable and ration-free chop. If they cost more money, or are irresistibly attractive to the shopper, there is less to spend on fruit and veg. The moral is too clear to need stating.

Fruit Trades' Journal, Dec. 8/56.

Mr. R. G. Darlington hints that we may not be far from a further revolutionary advance which could by-pass manure and the synthetic composts in use at present as cropping media.

Nurseryman & Seedsman, Nov. 29/56.

A Sussex firm, ELPREQ Horticultural Appliances of Eastbourne, working in conjunction with the South Eastern Electricity Board, has now completed and installed its first electronic control unit for mist propagation The unit—electronic leaf and magnetic valve—costs under £12.

Nurseryman & Seedsman, Nov. 29/56.

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Produce Packaging, 50 Hans Crescent, London, S.W.1.

B. & G. Review, 27 St. James Street, Covent Garden Market, London, W.C.2.

If the journals referred to are generally available, they are most easily obtained by placing an order with your bookseller or stationer.



GROWERS
AND
RESEARCH

MYCO MUSHROOM LABORATORIES
ROYDON, ESSEX

3rd December, 1956.

Dear Sirs,

We enclose herewith some photographs showing your new Feechen White Grain Spawn.

This was spawned on the 19th October, and run at a temperature of 65°F. As you can see from the photographs the run is unequalled, taking into account that these photographs were taken on the 31st October. The spawn was cased after twelve days run, and picking commenced three weeks after casing. We like to point out that if the spawn is run at 75°F, casing can be done in ten days; this we shall be doing on the next order.

Please put on order 25 cartons so we can truly give it a more intensive test. By the results obtained from the sample order we shall not regret it.

Yours faithfully, (Mycos Mushroom Laboratories),

Signed J. C. Cilia, B.Sc. (Microbiology).

Get results—FEECHEN WHITE GROWERS DELIGHT

98% of the Growers in Eire are using Feechen White Spawn
Now considered the most up-to-date Grain Spawn plant in Britain

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STANLEY
MIDDLEBROOK'S **PINHEADS**

156. I would like to wish my readers a Happy New Year. I would like to wish them a prosperous one too, but only on the condition that prosperity doesn't mean more mushrooms or more lb. per sq. ft. 'Tis a churlish condition, but I would not wish myself to be put out of business. Perhaps it's safer to wish all success to the Publicity Committee and hope that this means greater prosperity for all of us. At all events I don't wish you ill! (Not all of you!)

157. Paradoxically—after the above—I don't think we should ever be satisfied with our crops. If we have ever produced a 4 lb. crop (in normal cropping time) we should be able to repeat it. But to aim so high is to consign oneself to a lifetime of abject despair and abandoned hope—even if we haven't already done that by entering the Mushroom business! A more hopeful "satisfaction" target might be to aim for *nothing worse* than the highest average obtained over say the best 12 months in the last six year. If, for instance, the best average over any 12 months in that period was 2.25, we should not be satisfied with any crop under 2.25. If "aim" meant "achievement"—which it certainly doesn't—our target would never suffer a fall, but would gradually if slowly rise. I await a flood of letters from the statisticians telling me how wrong I can be.

158. I was surprised to read in *American Mushroom Industry News* that the average consumption of mushrooms per head in America is $\frac{1}{2}$ lb.—or about the same as in this country.

159. A director of a large firm, having prepared an elaborate scheme for saving his firm thousands of pounds by an economically sound conversion to oil-firing, presented the idea to his Board, and at the same time handed in his resignation with the words, "Gentlemen, I'm a clot; I failed to foresee Nasser's move." Many of us will feel like that. We boasted of our progressive modernisation when we turned over to oil, then out of the blue we get a kick of 3½d. a gallon and the possibility of no oil even at that high price. If we can't get it we've no heat; if we can get it we boil over when we contemplate the warmed-up economics. How thankful I am that we at Brayton retained our hot water boilers and underfeed stokers. How thankful we are that we forgot to strike out our registration for solid fuel! All we had to do when the shock came was to valve off our calorifiers and light boiler fires. There are times when old fashioned methods come into their own the good old shelf, for instance, doesn't call for fuel-devouring fork trucks, etc.!

160. If my Lufft weather hygrometer (cum thermometer cum barometer) is working properly, and a periodic check with a whirling hygrometer suggests it is, I must say I'm surprised at the very high outdoor relative humidities recorded during mid-September, October and November, despite low temperatures from the second week of October onwards. We normally close our bottom vents in cold weather, on the assumption that quick drying out takes place as cold air rushes

in. If the cold air is very moist perhaps we should think twice about it in future.

161. It seems to be true that our best crops are produced from composts prepared in frosty or very cold weather. Am I right in supposing there is at such times a greater movement of air through the stacks—more changes of air per hour, if you like—because of a greater temperature differential between the insides and outsides of the stacks, with a better type of fermentation as a result?

162. We fell short of compost for one bed and had to make up from a stack only 4 days old. Our normal composting takes 9 days (a reduction from the previous 11 or 12 in order to fit in with a new schedule) thus: 1st stacking, turn 3 days later, again at 6th day, and filled into house at 9th day. At stacking and first turns stacks are watered heavily and tramped as hard and uniformly as possible, so that until the sixth day they are extremely anaerobic, all our *aerobic* composting being done in the last three days in small triangles, aided later of course by peak heat. The compost for the above bed was taken from the stack the day after the 1st turn—4 days from first stacking. It was sour, green, foully anaerobic with lashings of ammonia. It peak heated to 130 or so with the rest of the house and then dropped to 110-100. The astonishing thing is that four days after filling it had lost all ammonia and had turned the same colour as the rest of the compost in the house. It was, however, still very wet. Quite baffling, as normal composts have frequently produced such an amount of ammonia at and after peak heat that we have had to keep the house hot for up to a week to clear it. I'm left with the impression that we don't know the first thing about composting processes. If this particular bed produces at all we shall be surprised—logic as at present understood is all against it. If it produces *well* there could be reason to believe it possible to cut out composting altogether as we know it. (If it produces *extraordinarily* well it will become a trade secret!) And yet it was way back in 1943—13 years ago!—that I tried what was then known as “Rapid Fermentation,” devised I think by Lambert. This was nothing more than a preliminary wetting of the manure (2 turns in 2 days outside) with all the essential composting done in the house. We tried it several times with mixed results but we had at least one pretty good crop for those days with those spawns, which proves its possibilities. As a stop press note I must add that so far spawn is growing as well in this bed as elsewhere. We shall see.

163. Our “brown” disease persists and increases. It is as yet unclassified, but it is not thought to be La France in that it doesn't “go through” a house. So far we've been unable to get a single clue as to its source and we can't find one common cause factor in the many instances of it. I feel rather like the frustrated aborigine who couldn't throw away his boomerang.

164. S.M.: “With petrol rationing and shortage of time it looks as though Pinheads will have to be written in jerky, shunting trains.”

F. C. Atkins: “Good, perhaps they'll have a little more movement.”

THE GERMAN MUSHROOM GROWERS' ASSOCIATION CONFERENCE

Numbering 82 members, the Association represents almost all the growers in West Germany; 108 people took part in the Conference, of whom 50 were full grower members. The Chairman, Mr. Erich Hullen, welcomed visitors from abroad, Mr. Guiochon, Jr., from France and others from Switzerland, Austria and Holland. Also present was a delegation from East Germany, headed by Dr. Arnold from the University of Halle. The town of Nurnberg was represented by Chief Inspector Eschborn, the Associated Unions of the Fruit and Vegetable Industry by Mr. Krause, the Centre of Mushroom Research by Dr. Botticher and the Max-Plank-Institute of Plant Research by Mr. Huhnke.

The Conference began with the "Practice of Mushroom Culture," an open discussion on diseases, the combat of the same, innovations and experiences. Mr. Hullen spoke first of his experiences with the "Olive Green Mould" (*Chaetomium olivaceum*). Participation in the discussion was very active indeed, so that practically all diseases such as *Penicillium*, White and Brown Plaster Mould, Mat Disease (*Myceliophthora*), were debated. A three-hour discussion on the theme "Composting with Horse Manure and Substrata, pasteurized and non-pasteurized" brought the morning session to an end.

The afternoon was spent in discussing housing and air-conditioning. The heating and ventilation of different types of buildings was discussed. Much interest was provided by controversial opinions on types of building, and the most successful insulation methods. All innovations and all new building materials should, it was stated, be reported to the Board of Directors in Erlangen, as it was the intention of the Max-Plank-Institute of Plant Research to open a department of Mushroom Research in the near future.

Mr. Krause from the Associated Canners then dealt with the economic aspect of the industry, speaking of the immediate and future economic prospects, the uncertain factors influencing the food industry, the organization of consumers, the present duty regulations and the markets and export.

Finally, Dr. Arnold from the University of Halle gave a most interesting account of the work of the Mushroom Research Institute which was opened about a year ago. Authorities in the East Zone have so far put fairly substantial funds at their disposal. The Halle project has three aims in view: **Research, Instruction of New Growers and Increased Production.** Research deals with the production of a better type of spawn, and the development of a synthetic compost—the latter is at present made on a basis of straw. Work is also being done on casing soil. This lecture was partly illustrated with some first-rate coloured lantern slides. **Newcomers** are invited to the University for a four-week lecture course, and already a hundred men and women have received tuition. Mushroom research started on a small area, was

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Manure Turner **FOR MUSHROOM GROWERS**

PETROL or ELECTRIC

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increased to $2\frac{1}{2}$ hectares, and will be doubled when a new government decree passed in 1956 comes into effect. Production in the country will then be greatly increased through the support of the government and the help of the newly educated "graduates." It would seem that the aim is to make mushrooms a national dish. Even the Soviet Union seems to be interested in a strong build-up, for it is reported that a number of mushroom houses are being erected in the vicinity of Moscow.

The meeting ended at 7 p.m. and at 8 p.m. all delegates assembled for dinner and a friendly gathering with music and dancing. But even here small groups formed to talk about mushrooms.

At the Annual General Meeting the Chairman, Mr. E. Hullen, gave a detailed account of the year's work and the Vice-Chairman read the statement of accounts. Mr. Hullen reported that under the "Green Plan" a government subsidy will replace the old produce tax on fresh and canned mushrooms. He also reported on his negotiations with the well-known Max-Plank-Institute. Attempts are being made to add a mushroom research department to this Institute. It is possible that the necessary funds for this project (DM. 160,000)* may be raised by the Board of Managers of the Max-Plank-Institute. The two main aims of the project are:—

1. Further improvements in methods of cultivation.
2. Development of new, better types of mushroom.

Mr. Gustave Greiner of Treuchtlingen then spoke of the difficulties of mushroom culture, a subject which was featured at the 2nd International Conference at Gembloux.

Dr. Wohlrab gave an account of the work of the committee appointed a year ago to consider the formation of a Sellers' Association.

After a short break for lunch, the conference was resumed at 3 p.m. and an active exchange of ideas took place until 6 p.m.

Mr. Hullen closed the Conference with a vote of thanks to delegates for an excellent attendance and lively participation in all discussions.

*£13,562—ED.

MGA APPOINTS HONORARY TREASURER

At the last meeting of the MGA Executive Committee, Mr. G. W. Baker (Chairman) suggested that the time had come for the appointment of an Hon. Treasurer to the Association.

Mr. Baker said that the duties of the Chairman had been steadily increasing and he felt that the Chairman should no longer be expected to deal with the finances, the more so as the income and expenditure of the Association was getting larger every year.

Mr. Baker's suggestion was unanimously agreed to and Mr. F. L. Filmer consented to serve.

At the same meeting, Messrs. F. Bleazard (Chairman), F. C. Atkins and Stanley Middlebrook agreed to serve on the Southport Refresher Course committee.

THINKING ALOUD

By D. N. DALTON

I always thought standard type farmers had a greater propensity for talking shop than anyone else. That was before I joined the MGA and got to know some mushroom growers! However, it is a pity more people don't suffer from the same affliction. There are far too many square pegs around and talking shop is a good sign.

As a small grower, I shall never forget my first farm walk, the awe-inspiring array of houses, gleaming concrete, the vast oil-fired boiler compared with my puny ex domestic, etc. The thing that impressed me most though, was the friendly atmosphere and the willingness with which members allowed a beginner to pick their brains. Then the inevitable adjournment to the local—drinks and more drinks—up to and beyond closing time, and still there was only one subject under discussion—mushrooms! It was after 2 a.m. when I got to bed, having shown a car load of people over my small outfit and served them with eggs and bacon—people, most of whom a few hours previously were total strangers to me!

Why do some people get such consistently high yields while others, using what appears to be identical methods, never seem to get beyond the $1\frac{1}{2}$ lb. per sq. ft. mark? No doubt this problem has exercised the minds of most growers.

I often wonder whether the answer may not be found in the simpler processes of trashing and watering which we are often content to leave to others. Do we devote too much attention to the other aspects of growing which admittedly, are more interesting? The experts never write articles on these mundane subjects which can surely make or mar a crop, however good the compost or peak-heat may have been. I have often felt I would like to watch an expert doing these 'routine' jobs and see if his ideas coincided with mine.

Composting, obviously, is of paramount importance. We all try and achieve the same result but go about it in so many different ways. The variations are legion, particularly if we include peak-heating; what with numbers of turns, intervals between them and durations of anything from a week to a month. Most of us stick rigidly to our own programmes, usually of necessity, but I sometimes wonder if we are right in doing so.

The quality of wheat straw varies enormously from weak and spindly to strong coarse stuff, depending on variety, soil on which it is grown, wet or dry season, fertilisers used, etc. It is obvious from this, that the same treatment will not produce the same result all the time, particularly if we bear in mind the generally accepted reasons for using wheat straw.

This is not an attempt to introduce another imponderable into mushroom growing but rather to suggest a possible explanation of the variation of crops when we think "everything was the same as last time."

If we concede that different deliveries of manure sometimes do require different treatments—and I have no doubt in my own mind that they do—many would find it impossible to vary the composting time as each operation follows a strict time-table. There are, it seems, two ways in which composting can be adjusted without upsetting the time-table. One is by the judicious use of activators. It is the second course however, which interests me most—a simple expedient which one never hears anything about. Why not stack the compost on a small rectangular or triangular frame running the length of the stack? This would enable the bacteria to get to work in that green bottom-centre section. I have always been meaning to try this but somehow, have never got round to it. Surely it must reduce the composting time or enable it to be carried a stage further in the same time. The flow of air through the channel could be varied by blocking up the ends.

Can anyone tell us more about this idea from practical experience? No theories please!

PUBLICITY CONTRIBUTIONS—DECEMBER

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*Previous contributions already acknowledged.

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SMALL ADVERTISEMENTS (*Cont'd. on page 32.*)

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Designed after consultations with growers, wholesalers and retailers, the Dring Mushroom basket embodies lightness, ease of stacking, rigidity and, above all, the wax impregnated board from which they are made *absolutely eliminates* the possibility of the mushrooms being spoiled through the basket absorbing moisture.



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*“O Tempora!
O Mores!”**



Cicero *might* have been declaiming at a Farm Walk, instead of denouncing the the Cataline conspiracy! What times indeed—a mushroom grower's life is nothing but a protracted schedule. He composts in 10 or 20 days, he pasteurises for 2 days. He crops for 6 weeks or 16—and when it comes to testimonials for 100% Productive Spawn, then it's 1 lb. in so many days or 3 lb. in ten weeks!

And—talking of customs—Cicero might well find some odd ways of doing the job, that have been handed down from father to son since Roman times. Every grower has his own ideas about the right way to cultivate mushrooms!

In searching for something enduring in those troubled times, how Cicero would have longed for a bedrock like 100% Spawn. At least growers to-day have *that* to fall back on, as the world appears to tumble about *their* ears!

** What times! What customs!*

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**PRODUCTIVE, PURE CULTURE
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THOSE LONG-TERM ASSURANCES DO INCLUDE HORTICULTURE

H. R. HAYNES (*Senior Horticultural Secretary, NFU*)

Growers will probably be aware that the Ministry of Agriculture issued a little booklet in August, 1956, entitled "At the Farmer's Service." This publication, copies of which can be obtained from the Ministry of Agriculture, Soho Square, London, W.1, contains much useful information, including details of all the grants which are available to the industry.

I very often find that growers are quite unaware of the facilities that are available to them and I would certainly recommend a study of this little publication. To quote one example: I still find that growers are unaware of the 50% grant towards the cost of farm water supplies available to owners and occupiers of agricultural land! This grant was at one time confined to certain branches of general farming but was extended some years ago to cover horticulture.

In November last, the Government published a White Paper on long-term assurances for agriculture which included details of a Farm Improvement Scheme which is of interest to horticulture. I feel that there should be some clarification as to the contents of this Paper and, therefore, before dealing with the Farm Improvement Scheme, it is worth mentioning that in its broad terms the White Paper was designed to provide part of the necessary foundation for a long-term investment in the agricultural industry as a whole. It aimed at giving minimum assurances on the review commodities and sought to obviate the annual "haggle" on the price review: the provisions of the White Paper referring to this particular subject do not affect horticulture. It is, however, a matter of satisfaction that the Improvement Scheme referred to above which, after all, was drawn up to help towards reduction in exchequer support for general farming was framed in such a way as to embrace our section of the industry in its provisions.

How much horticulture will get out of the Scheme is largely up to the growers themselves. A study of the paragraphs in the White Paper dealing with the Farm Improvement Scheme shows that the horticultural side of the industry stands to get real benefit from capital grants. As an example, it will be possible for a grower to claim grant aid in respect of any general building on a horticultural holding comparable with the type of building found on a general farm. This was confirmed in the Commons by the Secretary of State for Scotland in response to a question raised by a Scottish member. This covers the erection of such things as packing houses, storage accommodation, implement sheds and so on. The Scheme will extend to horticulture, grants for the alteration, enlargement and reconditioning of buildings, and for other permanent improvements, including road, electrification, and land reclamation.

It is true that grants will not be available for projects described by the Ministry of Agriculture as "anything that is used in factory-type production." This does, therefore, exclude the erection or installation of such things as gas and cold stores, Dutch lights and glasshouses but, by the same token, the yardstick employed will exclude specialised assets used by the general farmer such as grain drying machinery, milking machines and several other items.

It is worthy of note that it is said in the White Paper that the Farmers' Unions are carrying on discussions with the Government on other matters concerning the future of the agricultural industry. Among these are investment needs, credit and related matters, import policy, education, research and advisory matters. Growers may rest assured that when the Government consult with the Unions' leaders in further detailed examination of the views put forward, the problems of horticulture will be most strongly ventilated by the Unions.

CORRESPONDENCE

PARATHION IS A POISON!

It was interesting to read in the September Bulletin that Edwards ranks parathion among the favourite insecticides used at peak heat. If this is really so I am surprised; but that is not unusual. Personally I am a little scared of parathion, because it is a deadly poison and remains actively poisonous for some time after application. Those who use it are, I trust, *au fait* with the Agriculture (Poisonous Substances) Act, of 1952; at Cheshunt, in October, a grower was fined for allowing an employee to spray with parathion without protective clothing and for failing to provide soap and towels for his use after spraying. That was careless of the grower, unfortunate for the employee, and bad publicity for the industry.

FRED. C. ATKINS.

Comments Dr. Edwards:

Atkins is quite right to stress the poisonous nature of parathion and the precautions both laid down and needed for using it in *liquid form*. I do not know of any grower who uses it in this form for fumigating at peak-heat. I think it is unusual to use any liquid for this purpose, and insecticides or fumigants are normally used as dusts or smokes. Parathion cannot be used as a dust; when the smoke generators are used it is of course essential to leave the house quickly after lighting the generator, and to ventilate before working in it again, but there is no danger in normal handling of the smoke generators themselves. I should still have thought that parathion smoke generators were among the most popular fumigants for use at peak-heat, but perhaps the suppliers of insecticides or the Research Questionnaire may be able to tell us more definitely.



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1 lb. 15/6, 7 lb. £5 1. 6, 14 lb. £9 16. 0,
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3. Makes perfect emulsion, even in hard water—no stirring.

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